

## **SMEs Entrepreneurial Finance-Based Digital Transformation: Towards Innovative Entrepreneurial Finance and Entrepreneurial Performance**

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**Abstract:** The antecedents and determinants of entrepreneurial capabilities and competencies remain one of the incontestable questions that drive the exploitation and discovery of effective financial and digital opportunities. In the present paper, we propose a conceptual model based on Kirzner's alertness theory [entrepreneurial alertness] and rely on two factors [entrepreneurial orientation and marketing orientation] as key accelerators of entrepreneurial financial alertness. We assume that entrepreneurial financial alertness (EFA) might have a direct impact on entrepreneurial finance-based digital transformation (EFDT), which in turn, is expected to predict both innovation entrepreneurial finance (IEF) and SMEs' entrepreneurial performance (SMEEP). Structural equation modeling (SEM) was employed using data collected from a purposive sample size of 214 Jordanian entrepreneurs. Our findings largely support the impact of EFA on EFDT. EFDT was also supported having a significant impact on both IEF and SMEEP. Our study has many implications for both researchers and practitioners in the area of entrepreneurial finance-based digital transformation. The study has great added-value by proposing and examining a solid

theoretical foundation covering the most influential factors that drive digital entrepreneurial transformation as such transformation stands as an emerging and pressing issue, not fully tackled by prior studies. We also capture a deep understanding that particularly pertains to aspects of entrepreneurial finance success.

**Keywords:** Entrepreneurial financial alertness; digital transformation; innovative entrepreneurial finance; SMEs' entrepreneurial performance

## 1. Introduction

Entrepreneurship has been considered one of the most applicable and innovative solutions that would help worldwide communities and improve their lives (Beliaeva et al., 2020; Ahmed and Aassouli, 2022; Holzmann and Gregori, 2023; Paul et al., 2023; Müller and Wöhler, 2023; Chatterjee et al., 2022; Mir et al., 2022; Gomes and Lopes, 2023; Nambisan et al., 2019; Yang et al., 2021). In addition, entrepreneurship plays a key role in fostering sustainability by addressing poverty and unemployment problems, especially in the context of developing countries (Serwaah and Shneor, 2021; Chakraborty and Biswal, 2023; Beliaeva et al., 2020; Chakraborty and Biswas, 2019; Chatterjee et al., 2022; McAdam et al., 2019; Schiuma et al., 2022; Upadhyay et al., 2022; Zaheer et al., 2019; Cuntz and Peuckert, 2023). However, entrepreneurial success is not freely granted; it is rather described as an essential attribute to understand the surrounding environmental context and effectively exploit available opportunities, more specifically those related to technical and digital transformation (Elnadi and Gheith, 2023; Aladwani and Dwivedi, 2018; Mir et al., 2022; Tandon et al., 2020; Upadhyay et al., 2022).

It has been widely accepted that utilizing digital transformation opportunities significantly helps entrepreneurial businesses digitize their creative activities and processes, thus contributing to the emergence of so-called digital entrepreneurship (Ali et al., 2019; Berre and Le Pendeven, 2022; Dias and Rocha, 2023; Chatterjee et al., 2022; Mir et al., 2022; Srinivasan and Venkatraman, 2018; Yao and Li, 2023). According to Hull et al. (2007, p. 293), digital entrepreneurship can be defined as “a subcategory of entrepreneurship in which some or all of what would be physical in a traditional organization has been digitized.” In other words, digital entrepreneurship typically pertains to a new style of conducting business projects and transforming traditional business models into new creative ones that heavily rely on smart systems (Beliaeva et al., 2020).

Such growing interest is attributed to the wide range of benefits available to entrepreneurs who shift towards digital solutions and opportunities in conducting their businesses (Hansen, 2019; Zahra et al., 2023; Upadhyay et al., 2022; Zhai et al., 2022). In this regard, Davidson and Vaast (2010, p. 2) defined digital entrepreneurship as “the pursuit of opportunities based on the use of digital media and other information and communication technologies.” Digital solutions allow entrepreneurs to effectively communicate with customers; partners; and stakeholders,

contributing to social capital and informational capital (Upadhyay et al., 2022; Beliaeva et al., 2020; Zaheer et al., 2019; Holzmann and Gregori, 2023).

Practically, there are many high tech examples that entrepreneurial businesses can consider and adopt, such as artificial intelligence (AI) and machine learning; blockchain; Internet of Things (IoT); search engines; social media; cloud computing; big data; 3D printing; fintech; and e-crowdfunding (Ahadi and Kasraie, 2020; Gawel and Mińska-Struzik, 2023; Chatterjee et al., 2022; Dimitropoulos et al., 2019; Giones and Brem, 2017; Kraus et al., 2019; Schiuma et al., 2022; Wang et al., 2021; Secundo et al., 2020; Upadhyay et al., 2022).

However, entrepreneurs should possess and improve their digital skills to successfully integrate creative activities and processes (Steininger, 2019; Upadhyay et al., 2022). To emphasize more, a successful process of digital transformation presents a challenge that entrepreneurs will not be able to handle without fully exploring, creating, and utilizing opportunities embedded in the digital environment (Beckman et al., 2012). In this sense, more attention should be paid to business philosophy (i.e., marketing orientation and entrepreneurial orientation) and a set of capabilities (i.e., entrepreneurial alertness) that nurture continuous digital transformation (Abubakre et al. 2022).

Yet, the integration of digital transformation and its reflection on SMEs' innovation and performance is still highly debatable (Andriole, 2017; Beliaeva et al., 2020; Belyaeva et al., 2020; Davidson and Vaast, 2010; Gashenko et al., 2020; Kraus et al., 2019; Mir et al., 2022; Upadhyay et al., 2022). There is no clear and complete roadmap that explains how entrepreneurs' capabilities (i.e., entrepreneurial alertness) and orientation (marketing orientation) would accelerate the digital financial transformation within the SMEs sector. In this respect, Abubakre et al. (2022, p. 205) recently assured the fact that "we know very little about the particular behaviors and traits of entrepreneurs that influence successful DE outcomes." In fact, the vast majority of prior studies generally examined the antecedents and consequences of digital transformation process in the spectrum of digital entrepreneurship business, yet little attention was paid to aspects pertaining to the digital entrepreneurial finance in particular. Therefore, there is a gap in the existing literature, and a need has emerged to select a solid theoretical foundation that covers influential aspects of entrepreneurial finance.

All things considered; the current study attempts to address the following questions:

1. To what extent do marketing orientation and entrepreneurial orientation impact entrepreneurial financial alertness (EFA)?
2. To what extent does entrepreneurial financial alertness impact the entrepreneurial finance-based digital transformation (EFDT)?
3. To what extent does the entrepreneurial finance-based digital transformation (EFDT) impact innovative entrepreneurial finance and SMEs' entrepreneurial finance performance?

This study attempts to deepen the understanding of key antecedents and consequences of the digital transformation process in the entrepreneurial context. It proposes a comprehensive model addressing the key success factors pertaining particularly to the entrepreneurial finance performance. In this respect, it critically argues the feasibility of digital entrepreneurship by providing solid statistical evidence supporting the role of entrepreneurial finance-based digital transformation (EFDT) in accelerating both innovation entrepreneurial finance (IEF) and SMEs' entrepreneurial finance performance. Furthermore, the current study provides a number of practical and managerial implications that orient entrepreneurs in successfully integrating the digital financial transformation.

The rest of the current study is structured as follows: Section 2 carefully and critically reviews the main body of literature related to digital entrepreneurship. Section 3 discusses the conceptual model and research hypotheses. Research methodology is explained in Section 4 followed by Results interpretation in Section 5. Section 6 justifies the yielded results along with theoretical and practical implications. The last Section 7 is devoted to present the key conclusion of the current study.

## **2. Literature review**

The integration of smart systems (i.e., AI and machine learning; blockchain; social media; e-crowdfunding; and fintech) in all aspects of entrepreneurial activities was not a complementary issue but rather a competitive necessity (Chatterjee et al., 2022; Kundu et al., 2019; Morse et al., 2007). Business ecosystems were commonly reported by researchers and practitioners as effective mechanisms that contribute to the efficiency of products and services (Shukla et al., 2021). This has empowered businesses to produce and market at a lower cost and sell at competitive prices (Upadhyay et al., 2022). In the same vein, smart systems have helped businesses access a variety of cheaper and less risky funding alternatives, leading to better financial performance (Mir et al., 2022). This emerging activity has intrigued researchers' curiosity and pushed them to consider the most important enablers and inhibitors of entrepreneurial digital transformation (Zhai et al., 2022).

A careful review of the digital entrepreneurship literature leads to notice several issues related to digital transformation process such as technical resources and infrastructure (i.e., Chatterjee et al., 2020a; Kundu et al., 2019; Ngoasong, 2018; Shukla et al., 2021); market information (i.e., Ngoasong, 2018); culture (i.e. Abubakre et al., 2022; Upadhyay et al., 2022) capabilities (i.e. Mir et al., 2022; Ngoasong et al., 2018); benefits and challenges (i.e., Hansen, 2019); technology adoption and acceptance (i.e., Chatterjee et al., 2020a; Chatterjee et al., 2022; Mazzarol, 2015).

In this context, the leadership role was tackled by a number of researchers who argued that such leaders enjoy a set of competencies and skills that might contribute to successfully embracing digital transformation (i.e., El Sawy et al., 2020; Imran et al., 2020; Schiuma et al., 2022). For instance, Schiuma et al. (2022) have critically

reviewed and analyzed the main body of digital entrepreneurship literature. They explored how three competencies (wise leadership; transformative leadership; and digital leadership) can affect the successful process of digital transformation. Another systemic review study was undertaken by Kraus et al. (2019), who reviewed 35 research papers related to the digital entrepreneurship area. They concluded with six research themes, which are: entrepreneurship education; digital business models; social digital entrepreneurship; digital entrepreneurship process; platform strategies; and digital ecosystem.

Ngoasong (2018) discussed the contextual impact of entrepreneurial digital capabilities on the success of business activities. He operationalized it as a multi-dimensional construct comprising three aspects: institutional; technological; and local. His results supported the impact of these dimensions on the extent of entrepreneurs' abilities and needed competencies to effectively run their activities.

In their endeavours to discover key factors to adopt AI applications by family SMEs, Upadhyay et al. (2022a) have proposed a unique model based on careful constructs analyses and mapping. They identified important levers of business innovativeness and intention to adopt AI systems, which are: entrepreneurial orientation; technology orientation; business innovativeness; culture and flexible design; generativity; affordance; and openness. Their findings supported their proposed model, and they showed that about 64% of the variance was predicted in the intention to adopt AI systems. This has also validated the key factors predicting the entrepreneur's intention to adopt smart systems (i.e., AI applications). In as much, Upadhyay et al. (2022b) contributed to theorizing the model of "artificial intelligence acceptance and digital entrepreneurship (AIADE)". A group of factors was mutually integrated and validated such as performance expectancy; effort expectancy; social influence; hedonic motivation; attitude; innovativeness; uncertainty; inconvenience; generativity; openness; and affordances. Their findings supported all proposed factors except for attitude.

Furthermore, Chatterjee et al. (2022) empirically examined key factors behind the digital transformation process in the context of Indian SMEs. They proposed an integrated model based on the Technology Acceptance Model (TAM) and willingness to change. They also moderated the role for both AI-enabled CRM and strategic planning. Their empirical results largely supported the significant impact of perceived ease of use; perceived usefulness; and willingness to change. They concluded that the impact of such factors on corporate digital entrepreneurship is accentuated by the moderating role of AI-enabled CRM and strategic planning. On the other hand, the capital theory was proposed by Mir et al. (2022) to study key factors predicting the digital entrepreneurs' intention. Their empirical analysis contributed to validating the impact of four factors (i.e., innovative cognition; competence; social media adroitness; and role models) on the digital entrepreneurial goal intention, which in turn, predicted the digital transformation process. Based on data collected from 169 university students, Zenebe et al. (2017) confirmed the impact of entrepreneurial

orientation on the adoption of information technology and knowledge systems. They also discovered that such a causal relationship between the latter variables is dynamic and tied to entrepreneurs' age and gender. In their systematic review, Serwaah and Shneur (2021) reviewed about 113 papers about entrepreneurial finance related to factors affecting women's ability to access financial resources. Their results assured the importance of both explicit and symbolic factors on the women's accessibility of financial resources.

Differently, digital entrepreneurship was formulated by Soluk et al. (2022) as a factor that can positively moderate the relationship between some social factors (i.e., family support; community support; and business partner support) and entrepreneurship level. Their results demonstrated that the impact of social factors on entrepreneurship is likely strengthened by the increased level of technology. Women's technology skills and knowledge have also been proposed by Shukla et al. (2021) as a moderator of the relationship between attitudes toward entrepreneurship and the intention to engage in businesses. They found that women are more likely to have positive entrepreneurial attitudes if they enjoy a high level of technology and internet skills. Accordingly, they will be more motivated and engaged in entrepreneurial businesses.

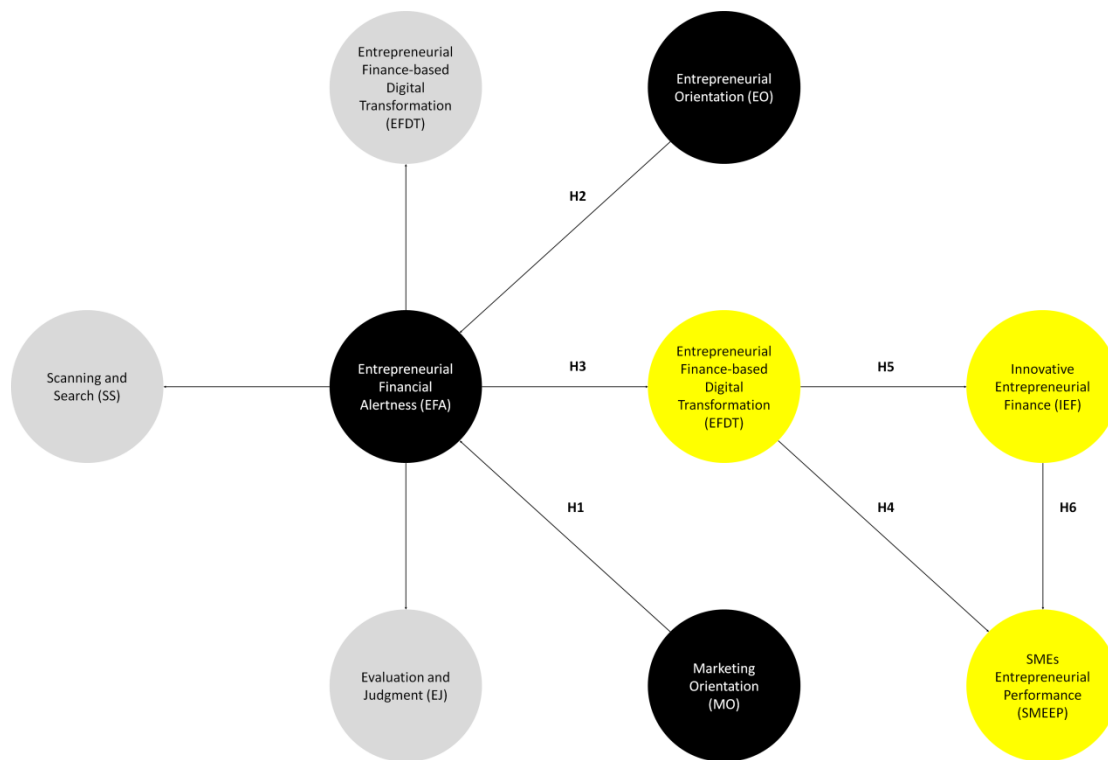
Remarkably, extensive research portion was dedicated to uncovering the main consequences of digital entrepreneurship. The systematic review paper of Mazzarol et al. (2015) highlighted the strategic role of digital entrepreneurship in enhancing SMEs' effectiveness and value of practices (i.e., commerce; marketing; and business). Mazzarol et al. (2015) stressed that digital transformation is a necessity for the organization to survive and compete. Moreover, a recent study conducted by Koomson et al. (2022) pinpointed the role of mobile money in sustaining entrepreneurial businesses in terms of digital saving and accessing digital credit in the context of African countries (i.e., Kenya; Tanzania; and Ghana). They confirmed the positive role of mobile money in enhancing digital saving; accessing credits; and digital insurance. Furthermore, Sigfusson and Chetty (2013) explored the role of social media tools and platforms in empowering entrepreneurs to attract new customers; initiate and sustain international collaboration and association; and accordingly, facilitate the international transformation of the company. Entrepreneurs' experience, skills, and motivation were also proven by Zaheer et al. (2019) as key levers of the success of entrepreneurial SMEs. According to Walsh (2014), the success of digital entrepreneurship was observed to be affected by four basic needs: need for power, need for affiliation, need for achievement, and intrinsic needs. These four needs have been recently proposed and empirically approved by Abubakre et al. (2022), along with key predictors of digital entrepreneurship success (i.e., experience; IT culture; and innovativeness).

Regardless of the contribution of prior digital entrepreneurship studies, there is still a lack of related knowledge of the main determinants and predictors of entrepreneurs' capabilities (i.e., entrepreneurial alertness) and the magnitude of the impact on the digital financial transformation. For instance, Abubakre et al. (2022, p. 204) reported

that “very little or no study has explored the predictors of behavior and traits that determine digital entrepreneurship (DE) success.” Despite the growing number of studies interested in digital entrepreneurship, there is still scant attention paid to understanding aspects pertaining to digital entrepreneurial finance in particular. To address this gap, the current study attempts to select and validate a model that uncovers the most influential determinants of entrepreneurial finance success. More explanations and discussions are presented in the forthcoming section regarding the study model and hypotheses.

### **3. Conceptual Model**

According to Kirzner (1973, 1999), entrepreneurial alertness is one of the key cognitive competencies that make entrepreneurs think and behave differently from normal people. In other terms, high alert entrepreneurs are more able to discover or create new opportunities than normal people (Alalwan et al., 2022; Zhao et al., 2021; Sharma et al., 2019; Neneh et al., 2019; Tang et al., 2012). The prior literature commonly reported entrepreneurial alertness as a central component of ensuring the success of entrepreneurial ventures, and successful exploitation of available opportunities (Kirzner, 1999; Sharma, 2019; Tang et al., 2012; Troise and Tani, 2020). Therefore, Kirzner’s alertness theory [entrepreneurial alertness] was selected as a theoretical base in proposing the current study model (see Figure 1). Two factors [entrepreneurial orientation and marketing orientation] were also proposed in the current model as key accelerators of entrepreneurial financial alertness (Dubey et al., 2020). Furthermore, entrepreneurial financial alertness was proposed to have a direct impact on entrepreneurial finance-based digital transformation (EFDT), which in turn, is expected to predict both innovation entrepreneurial finance (IEF) and SMEs entrepreneurial performance (SMEEP).



**Figure 1: Conceptual model Adapted from Bamgbade et al. (2022); Chen et al. (2020); Dubey et al. (2020); Kirzner (1973, 1999); Merrilees et al. (2011)**

### 3.1. Marketing Orientation

Marketing orientation is a kind of company culture and philosophy focusing on the importance of matching consumer needs and expectations as well as providing attention to creativity and innovation (Cano et al., 2004; Li et al., 2006; Nguyen et al., 2015; Reijonen et al., 2015). Three main dimensions (customer orientation, competitor orientation, and inter-functional coordination) should be taken into account by the company that adopts marketing orientation as a cultural base (Jain et al., 2015; Nguyen et al., 2015). Market orientation also presents a mechanism by which businesses and entrepreneurs acquire, learn, and effectively utilize market information regarding unexpressed customers' needs (Kohli and Jaworski, 1990; Nguyen et al., 2015). Therefore, marketing orientation pertains to the way that latent market opportunities would be alerted to and considered by businesses and entrepreneurs as well (Baker and Sinkula, 2005; Cano et al., 2004; Habibi et al., 2015; Kohli and Jaworski, 1990; Mutlu and Sürer, 2016; Nguyen et al., 2015; Papadas et al., 2017; Schulz et al., 2017). This, in turn, leads to more innovative ideas for new products; services; and even capturing new resources (Li et al., 2006; Narver et al., 2004; Nguyen et al., 2015; Yousaf et al., 2018). Accordingly, marketing orientation, as a cultural base, is a source of inspiration, stimulating entrepreneurs to be more alert toward the available opportunities (Atuahene-Gima et al., 2004; Tsiotsou et al., 2011). Thus, we propose the following hypothesis:

***H1: Marketing orientation positively influences entrepreneurial financial alertness.***



### **3.2. Entrepreneurial orientation**

According to Boso et al., (2013); Lumpkin and Dess (1996); and more recently Upadhyay et al. (2022), entrepreneurial orientation would be captured in the extent of the company's readiness to discover the latent opportunities via building and sustaining the supportive and needed competencies. One of the most important competencies and capabilities is opportunity-seeking as reported by Avlonitis and Salavou (2007) and Lumpkin and Dess (1996). In different words, entrepreneurial orientation represents a state of conscious readiness and work philosophy in the continuous quest to discover opportunities and make good use of them while daring to take the risks (Avlonitis and Salavou, 2007; Hughes et al., 2016; Baker and Sinkula, 2009; Boso et al., 2013; George and Marino, 2011; Hughes et al., 2017; Kickul et al., 2011; Lumpkin and Dess, 2001; Miller, 1983; Reijonen et al., 2015; Upadhyay et al., 2022). Chavez et al. (2017) and Preda (2013) also reported that entrepreneurially oriented companies have a great keenness to keep pace with the changes taking place in the needs of consumers and the capabilities of competitors. These companies, therefore, have a constant alertness toward all available and latent opportunities that help them reach their endeavors (Dubey et al., 2020; Yousaf et al., 2018). Consequently, it is argued that entrepreneurial orientation, as a company mindset, would effectively leverage the company's alertness toward new opportunities and innovative ideas (Baker et al., 2009; Bernardes and Hanna, 2009; Giunipero et al., 2005; Kickul et al., 2011; Upadhyay et al., 2022; Yadav et al., 2021). All things considered, the current study postulates that SMEs with high levels of entrepreneurial orientation are more likely to enjoy entrepreneurial financial alertness toward new opportunities comprised in the digital transformation (Chen et al., 2012; George and Marino, 2011; Parveen et al., 2015; Rauch et al., 2009; Reijonen et al., 2015; Tajeddini, 2010; Upadhyay et al., 2022; Zaheer et al., 2019). This assumption was empirically supported by Sahi et al. (2019), who validated the significant impact of entrepreneurial alertness on SMEs' operational responsiveness to new opportunities. The following hypothesis proposes that:

***H2: Entrepreneurial orientation positively influences entrepreneurial financial alertness.***

### **3.3. Entrepreneurial Financial Alertness**

It is well known that alerted entrepreneurs are more able to scan, evaluate, and successfully exploit new opportunities within their surrounding environment (Kirzner, 1999; Sharma, 2019; Tang et al., 2012; Troise and Tani, 2020). In fact, digital transformation and finance-based digital transformation in particular present a valuable opportunity that cannot be discovered or attained when entrepreneurial alertness is missing (Alalwan et al., 2022; Beliaeva et al., 2020; Valliere, 2013). In this respect, Davidson and Vaast (2010, p. 2) emphasized digital entrepreneurship as "the pursuit of opportunities based on the use of digital media and other information and communication technologies." However, exploiting such opportunities is not

something granted, but rather relies on the degree of entrepreneurial alertness and capability to materialize such opportunities (Alalwan et al., 2022; Beliaeva et al., 2020; Chen et al., 2020; Neneh, 2019). As entrepreneurial alertness is one of the key levers to having a successful entrepreneurial finance-based digital transformation, the current study follows the proposition of Tang et al. (2012) and operationalizes entrepreneurial alertness as a multi-dimensional construct that comprises three aspects: scanning/search (SS); association and connection (AC); and evaluation and judgment (EJ). These later features were collectively considered key prerequisites to unleashing new opportunities (i.e., digital transformation). Accordingly, the following hypothesis was proposed:

***H3: Entrepreneurial financial alertness will positively influence entrepreneurial finance-based digital transformation (EFDT).***

### **3.4. Entrepreneurial finance-based digital transformation (EFDT)**

Entrepreneurs were increasingly trying to make the most of the clever solutions built into the digital transition, as was previously mentioned (Gomes and Lopes, 2023; Chatterjee et al., 2022; Mir et al., 2022). Digital transformation is conceptually described as the methodical process utilized to restructure societies, organizations, and economies (Matarazzo et al., 2021). Indeed, digital transformation presents an area of interest in the entrepreneurial sector from both perspectives: scientific and practical. This phenomenon led to the emergence of digital entrepreneurship (i.e., Davidson and Vaast, 2010; Hansen, 2019; Upadhyay et al., 2022). Digital transformation introduces innovative and smart digital mechanisms and tools (i.e., blockchain; IoT; search engines; social media; cloud computing; big data; 3D printing; fintech; and e-crowdfunding), which have considerably contributed to the dynamism and agility of the entrepreneurial atmosphere (Baabdullah et al., 2019; Davison et al., 202; Ahadi and Kasraie, 2020; Chatterjee et al., 2022; Hansen, 2019; Schiuma et al., 2022; Upadhyay et al., 2022; Wang et al., 2021; Zhai et al., 2022). Such creative systems and methods help address different kinds of risks and uncertainties that might hinder entrepreneurs' ability to effectively run businesses (Abubakre et al., 2022; Beliaeva et al., 2020; Zaheer et al., 2019). This, in turn, considerably and positively affects SMEs' entrepreneurial finance performance. Accordingly, the following hypothesis was proposed:

***H4: Entrepreneurial finance-based digital transformation (EFDT) will positively influence SMEs' entrepreneurial finance performance.***

The entrepreneurial finance-based digital transformation (EFDT) also empowers entrepreneurs to address financial constraints that hinder SMEs' success by providing smart mechanisms that would predict new opportunities (i.e., AI and machine learning); funding sources (e-crowdfunding); payment methods (i.e., fintech and mobile payment) (Koomson et al., 2022; Senyo et al., 2020; Senyo and Osabutey, 2020). Insofar, the digital transformation has accelerated contracts' effectiveness between entrepreneurs, business partners, and stakeholders. As a result, this has led to

leveraging entrepreneurs' innovation capabilities to acquire knowledge, discover new opportunities, and work creatively (Alaassar et al., 2022; Alalwan et al., 2022; Beliaeva et al., 2020; Upadhyay et al., 2022; Zaheer et al., 2019). Therefore, digital transformation has modernized relevant practices and activities toward more generative, innovative, and competitive production processes that help create and exchange values with customers (Matarazzo et al., 2021; Rothberg and Erickson, 2017; Yadav and Pavlou, 2014). Accordingly, the following hypothesis was proposed:

***H5: Entrepreneurial finance-based digital transformation (EFDT) will positively influence innovation-driven entrepreneurial finance (IEF).***

### **3.5. Innovation entrepreneurial finance (IEF)**

According to Seyfang and Smith (2007, p. 586), business innovation is generally articulated as “the successful exploitation of new ideas – incorporating new technologies, design and best practice [which] is the key business process that enables businesses to compete effectively”. As for the current study, business innovation or innovative entrepreneurial finance would be conceptualized as the extent to which entrepreneurial businesses are able to discover new market and financial opportunities by engaging more in digital transformation (Upadhyay et al., 2022). Further, innovativeness presents a high-level of entrepreneurial business readiness to apply smart business models that guarantee better business performance (Camison and Villar Lopez, 2010). The significant impact of business innovativeness on business performance was validated by different studies in the area of entrepreneurial businesses (i.e., Luo et al., 2021; Ornek and Ayas, 2015; Sriboonlue, 2019; Veronica, et al., 2020; Xu et al., 2022; Yıldız et al., 2014). Thus, we propose the following hypothesis:

***H6: Innovation entrepreneurial finance (IEF) will positively influence SMEs entrepreneurial finance performance.***

## **4. Methodology**

### **4.1 Research design**

The data for the current study was collected using an online questionnaire distributed to a purposive sample size of 400 Jordanian entrepreneurs. Jordan was selected as the main context due to the importance and considerable size of SMEs and entrepreneurial businesses. For 2020, we relied on 100,000 SMEs and entrepreneurial companies in Jordan, which represents around 97% of the total number of national companies (Global Entrepreneurship Monitor, 2020). Furthermore, the study is significant in terms of its impact on the Jordanian economy regarding the labor market (60% of Jordanian Workforces) and national GDP with 50% (Global Entrepreneurship Monitor, 2020).

## 4.2 Questionnaire and constructs

Following Tang et al. (2012), the entrepreneurial financial alertness was approached as a multi-dimensional construct that comprises three aspects: scanning/search (SS); association and connection (AC); and evaluation and judgment (EJ), measured using scale items (see Table 1). Marketing orientation was tested based on scale measurements proposed by Farrelly and Quester (2003) and recently validated by Merrilees et al. (2011) in the context of SMEs. Entrepreneurial orientation was measured based on the scale proposed by Dutot and Bergeron (2016); Fan et al. (2021); and more recently, Upadhyay et al. (2022). To gauge creative entrepreneurial finance, a scale developed by Bamgbade et al. (2022), Seyfang and Smith (2007), and Upadhyay et al. (2022) was taken into consideration. The effectiveness of SMEs' entrepreneurial finance was evaluated using scale items suggested by Cooper and Artz (1995) and validated by Chen et al. (2020). Five scale items proposed by Srinivasan et al. (2002) and adopted by Shaltoni and West (2010) were used to measure the entrepreneurial finance-based digital transformation (EFDT). In this respect, five common applications (AI and machine learning; big data; blockchain; fintech; cloud computing; and e-crowdfunding) were also considered and mentioned in the scale items used to measure the entrepreneurial finance-based digital transformation (EFDT) (Amoako et al., 2021).

We use a seven-point Likert scale to test the respondents' agreement with each proposed question. First, the questionnaire was translated to Arabic using back-translation method recommended by Brislin (1976). The translated version was then pre-tested by number of experts in the areas of entrepreneurship; business; and marketing where all experts validated the Arabic version (Bhattacharjee, 2012; Saunders et al., 2003; Sekaran, 2003). Furthermore, a pilot study was conducted based on a sample of 25 entrepreneurs in Jordan. The vast majority of participants assured the clarity of the language of the questionnaire. Cronbach's coefficient alpha values for all latent constructs were also inspected and found to be above 0.70, as recommended by Nunnally (1978) which in turn, supports the scale items' reliability of the present study.

**Table 1: Measurement Items**

Construct		Items		Sources
Entrepreneurial financial alertness	Scanning and searching	SS1	I always keep an eye out for new financial business ideas when looking for information.	Tang et al. (2012); Troise and Tani (2020); Zhao et al. (2005)
		SS2	I have frequent interactions with others to acquire new financial information.	
		SS3	I am always actively looking for new financial information.	
	Association and connection	AC1	I often make novel connections and perceive new or emergent relationships between various pieces of financial information.	
		AC2	I am good at “connecting dots”.	
		AC3	I often see connections between previously unconnected domains of financial information.	
	Evaluation and judgment	EJ1	I have a gut feeling for potential financial opportunities.	
		EJ2	I can distinguish between profitable opportunities and not-so-profitable financial opportunities.	
EJ3		When facing multiple financial opportunities, I am able to select the good ones.		
Entrepreneurial orientation	EO1	Our firm appreciates financial innovations above everything else.	Dutot and Bergeron (2016); Fan et al. (2021); Upadhyay et al. (2022)	
	EO2	Our firm emphasizes risk-taking.		
	EO3	Our firm intends to get into markets before our competition.		
	EO4	Our firm in last five years has brought several new financial products or services to the market.		
	EO5	Our firm emphasizes R&D, technological leadership, and innovativeness instead of trusting only those products and services, that we have traditionally found to be good.		
Marketing orientation	MO1	Our firm is more likely to plan ahead to satisfy customers in the future.	Farrelly and Quester (2003); Merrilees et al. (2011)	
	MO2	Our firm responds more quickly to customer requirements.		
	MO3	Our firm places a priority on making changes to improve customer satisfaction.		
	MO4	Our firm has better market intelligence.		
	MO5	Our firm is more likely to target customers where we have a competitive advantage.		
	MO6	Our firm undertakes market research to measure satisfaction.		
Entrepreneurial finance-based digital transformation	EFDT1	The latest smart systems (e.g., artificial intelligence and machine learning; big data; blockchain; fintech; cloud computing; e-crowdfunding) are installed in our firm.	Shaltoni and West (2010); Srinivasan et al. (2002)	
	EFDT2	We use smart systems (e.g., artificial intelligence and machine learning; big data; blockchain; fintech; cloud computing; e-crowdfunding) to communicate with our customers and our business partners.		
	EFDT3	We use smart systems (e.g., artificial intelligence and machine learning; big data; blockchain; fintech; cloud computing; e-crowdfunding) to support our firm's traditional commercial and financial activities (e.g., pricing information; capital raising; financial monitoring; borrowing; payment).		

	EFDT4	We use smart systems (e.g., artificial intelligence and machine learning; big data; blockchain; fintech; cloud computing; e-crowdfunding) to conduct commercial transactions (e.g. selling products and accepting payment via web site).	
	EFDT5	Smart systems (e.g., artificial intelligence and machine learning; big data; blockchain; fintech; cloud computing; e-crowdfunding) will be the core technology critical to our company's future success.	Amoako et al. (2021)
Innovation entrepreneurial finance	IEF1	Creating new financial ideas, processes, products and systems is critical to the success of our firm.	Bamgbade et al. (2019); Seyfang and Smith (2007); Upadhyay et al. (2022)
	IEF2	Our firm tends to be an early adopter of the innovative financial technologies.	
	IEF3	Our firm actively seeks innovative financial technologies.	
	IEF4	Our firm proactively uses innovative financial technologies to meet customer needs.	
SMEs entrepreneurial finance performance	SMEEP1	Our firm currently has good revenue situation.	Chen et al. (2020)
	SMEEP2	We are satisfied with the new firm's sales growth rate of the last three years.	
	SMEEP3	We are satisfied with the new firm's market share in the last three years.	
	SMEEP4	Our firm has a high degree of potential growth opportunity.	

## 5. Results

### 5.1. Sample Profiles

Out of the four hundred questionnaires distributed, two hundred and fourteen were fully completed. As seen in Table 1, 69.15% of participants were male, while one third of the study sample is female. About 54.20% of sample participants are in the age range of 31 to 40, followed by the age range of 41 to 50 (18.69%) and the age range of 25 to 30 (16.82%). Around 15.88% of the sample's members hold a diploma, whereas more than half (59.81%) of the present sample have bachelor's degrees. Targeted entrepreneurs are overwhelmingly employed by the food (16.6%) and retail (17.2%) industries.

**Table 2: Respondents' Demographic Characteristics**

Demographic Profile	Number of Respondents (N= 214)	Percentage (%)
<b>Gender</b>		
Male	148	69.15
Female	66	30.85
Total	214	100
<b>Age</b>		
18-24	11	5.14
25-30	36	16.82
31-40	116	54.20
41-50	40	18.69
51-60	8	3.73
60+	3	1.40
Total	214	100
<b>Education Level</b>		
High school	16	7.47
Diploma	34	15.88
Bachelor	128	59.81
Master	28	13.08
PhD	6	2.80
Other	2	0.93
Total	214	100
<b>Nature of the Context</b>		
Food Industry	41	16.6
Pharmaceutical Industry	27	15.3
Detergent and steriliser industry	21	14.6
Service	36	12.1
Agriculture	23	8.03
Wholesaling merchandising	34	15.6
Retailing	32	17.2
Total	214	100

## 5.2. Descriptive Statistics of the Measurement Items

A seven-point Likert scale was used to measure thirty-three scale items in the current questionnaire. All scale items were given favorable ratings by the sample participants, as shown in Table 3, with an average mean value of at least 4.64. (MO5). The scale items used to assess innovative financial practices in entrepreneurship had the highest average mean value (6.18) and the lowest standard deviation (0.89). The average mean values accounted to scale items of the EFA's dimensions were as follows: AC (5.83; standard deviation = 1.00); SS (5.67; standard deviation = 1.05); and EJ (5.51; standard deviation = 1.12). This indicates that the entrepreneurs targeted in the current sample appear to have a high level of EFA. The average mean of the scale items utilized in this regard was 5.67, and the standard deviation was 0.98, indicating that sample members also valued EO-related elements. The sample participants also gave favorable ratings to MO items, with an average mean score of 5.07 and a standard deviation of 1.20. With an average mean value of 6.18 and a standard deviation of 0.89, the measurement items of the IEF had the highest average mean value. The sample participants gave the EFDT measuring items good ratings, with an average mean of 5.85 and a standard deviation value of 1.06. Last but not least, the sample participants gave good ratings to four of the SMEEP measurement items, with an average mean score of 5.65 and a standard deviation value of 1.07.

**Table 3: Descriptive Statistics of the Measurement Items**

Construct	Item	Mean	Std. Deviation
AC	AC1	5.90	0.93
	AC2	5.86	1.06
	AC3	5.80	1.03
	Average	5.83	1.00
SS	SS1	5.65	1.05
	SS2	5.64	1.11
	SS3	5.74	1.00
	Average	5.67	1.05
EJ	EJ1	5.55	1.08
	EJ2	5.59	1.13
	EJ5	5.39	1.15
	Average	5.51	1.12
EO	EO1	5.55	1.10
	EO2	5.83	0.87
	EO3	5.81	0.89
	EO4	5.50	1.04
	EO5	5.66	1.02
	Average	5.67	0.98
MO	MO1	4.91	1.32
	MO2	4.98	1.22
	MO3	5.24	1.13
	MO4	5.46	1.23
	MO5	4.64	1.17
	MO6	5.20	1.15
	Average	5.07	1.20
IEF	IEF1	6.32	0.83
	IEF2	6.04	0.95
	IEF3	6.18	0.86



	IEF4	6.21	0.92
	Average	6.18	0.89
EFDT	EFDT1	5.87	1.07
	EFDT2	5.75	1.14
	EFDT3	5.92	1.07
	EFDT4	5.97	0.98
	EFDT5	5.78	1.07
	Average	5.85	1.06
	SMEEP	SMEEP1	5.36
SMEEP2		5.67	0.99
SMEEP3		6.07	1.04
SMEEP4		5.52	1.19
Average		5.65	1.07

### 5.3. Structural Equation Modeling

#### 5.3.1. Measurement Model

A measurement model was conducted in the current study to assure that all latent constructs adequately match the criteria of reliability and validity. A number of fit indices (i.e., GFI; AGFI; CFI; CMIN/DF; NFI; RMSEA) were also considered to see the extent to which measurement model adequately fits the observed data or if it needs further revisions (i.e., Anderson and Gerbing, 1988; Byrne, 2010; Hair et al., 2010). Based on Table 4, four fit indices (GFI=0.841; AGFI=0.764; NFI= 0.862; CFI= 891) were not able to exist within their threshold levels, and therefore, there was a need to purify the current model by removing the most problematic items (i.e., Anderson and Gerbing, 1988; Byrne, 2010; Hair et al., 2010). Careful reviewing Standardised Regression Weights table in the AMOS output file leads to three scale items: MO1 (marketing orientation); IEF1 (innovation entrepreneurial finance); and EFDT4 (entrepreneurial finance-based digital transformation). The measurement model was tested again, and all fit indices of the purified measurement model remain within their respective threshold levels as follows: GFI= 0.908; AGFI= 0.824; CFI= 0.948; CMIN/DF= 2.586; NFI=0.927; RMSEA=0.066 (Hair et al., 2010).

**Table 4: Fit indices of Measurement Model**

Fit indices	Cut-off point	Initial measurement Model	Revised measurement Model
CMIN/DF	≤3.000	2.734	2.586
GFI	≥ 0.90	0.841	0.908
AGFI	≥ 0.80	0.764	0.824
NFI	≥ 0.90	0.862	0.927
CFI	≥ 0.90	0.891	0.948
RMSEA	≤ 0.08	0.074	0.066

Six latent constructs proposed in the current study were subjected to reliability and validity tests. The composite reliability (CR) for all constructs was tested and found to be above 0.70, with values ranging from 0.797 (EFA) to 0.912 (EFDT) (Anderson and Gerbing, 1988; Hair et al., 2010). As seen in Table 6, Cronbach's alpha ( $\alpha$ ) was also inspected for six latent constructs and found to be higher than 0.70, following Nunnally (1978). The highest Cronbach's alpha ( $\alpha$ ) value (0.909) was recorded for EFDT, while the lowest value was for EFA (0.793). Average variance extracted

(AVE) values were tested for all constructs with threshold values not less than 0.50, as recommended by Hair et al. (2010). The AVE values ranged between 0.567 (EO) and 0.722 (EFDT).

Standardised regression weight values (factor loading) for all unremoved scale items were above 0.50 (Anderson and Gerbing, 1988; Hair et al., 2010) based on Table 5. It is also worth mentioning that EFA was treated as a second-order factor comprising three dimensions (SS; AC; and EJ), which were tested as first-order factors. SS, AC, and EJ were able to significantly load EFA with regression values of 0.643; 0.788; and 0.822, respectively (Hair et al. 2010).

**Table 5: Standardised Regression Weights**

			Estimate
SS	<---	EFA	0.643
AC	<---	EFA	0.788
EJ	<---	EFA	0.822
SS1	<---	SS	0.802
SS2	<---	SS	0.902
SS3	<---	SS	0.615
AC1	<---	AC	0.695
AC2	<---	AC	0.841
AC3	<---	AC	0.804
EJ1	<---	EJ	0.881
EJ2	<---	EJ	0.861
EJ3	<---	EJ	0.748
EO1	<---	EO	0.706
EO2	<---	EO	0.739
EO3	<---	EO	0.766
EO4	<---	EO	0.771
EO5	<---	EO	0.779
MO2	<---	MO	0.798
MO3	<---	MO	0.778
MO4	<---	MO	0.752
MO5	<---	MO	0.791
MO6	<---	MO	0.865
IEF2	<---	IEF	0.837
IEF3	<---	IEF	0.915
IEF4	<---	IEF	0.679
EFDT1	<---	EFDT	0.802
EFDT2	<---	EFDT	0.875
EFDT3	<---	EFDT	0.881
EFDT5	<---	EFDT	0.839
SMEEP1	<---	SMEEP	0.741
SMEEP2	<---	SMEEP	0.784
SMEEP3	<---	SMEEP	0.795

SMEEP4	<---	SMEEP	0.765
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Discriminant validity was also tested by looking at the inter-correlation values between the latent constructs and comparing them to the square root of the AVE captured by each construct (Kline, 2005). As seen in Table 6, the inter-correlation values were less than 0.85, as suggested by Kline (2005). The square roots of AVE for all latent constructs were found to be higher than the inter-correlation values with corresponding constructs.

**Table 6: Discriminant Validity**

	CR	Cronbach's alpha ( $\alpha$ )	AVE	IEF	EO	EFA	EFDT	MO	SMEEP
IEF	0.855	0.853	0.666	<b>0.816</b>					
EO	0.867	0.864	0.567	0.377	<b>0.753</b>				
EFA	0.797	0.793	0.570	0.169	0.474	<b>0.755</b>			
EFDT	0.912	0.909	0.722	0.332	0.678	0.551	<b>0.850</b>		
MO	0.897	0.891	0.636	0.313	0.732	0.470	0.638	<b>0.798</b>	
SMEEP	0.876	0.874	0.586	0.424	0.723	0.608	0.715	0.743	<b>0.766</b>

**Note: Diagonal values are squared roots of AVE; off-diagonal values are the estimates of inter-correlation between the latent constructs.**

### 5.3.2. Structural Model Analysis

The structural model was tested in the current study to validate the conceptual model and test the main research hypotheses. Similar to the measurement model, the structural model was able to adequately fit the observed data as all fit indices existed within their respective threshold levels, as such GFI= 0.904; AGFI= 0.819; CFI= 0.941; CMIN/DF= 2.666; NFI=0.923; RMSEA= 0.068 (Hair et al., 2010). Two factors (MO and EO) account for 51% of the variance in EFA while 56%; 52% and 54% of variance were recorded for SMEEP; IEF; and EFDT, respectively. Six proposed research hypotheses were significant. In details, both EO ( $\gamma=0.503$ ,  $p<0.000$ ) and MO ( $\gamma=0.426$ ,  $p<0.000$ ) significantly predict EFA. The most significant and strongest hypothesized path was depicted between EFA and EFDT with  $\gamma=0.751$  and  $p<0.000$ . As expected, EFDT significantly predicts both IEF ( $\gamma=0.355$ ,  $p<0.000$ ) and SMEEP ( $\gamma=0.638$ ,  $p<0.000$ ). A significant relationship was also confirmed between IEF and SMEEP ( $\gamma=0.208$ ,  $p<0.006$ ).

**Table 7: Hypotheses Testing**

Hypothesised path			Estimate	S.E.	C.R.	P
EFA	<---	EO	.503	.062	4.470	***
EFA	<---	MO	.426	.048	4.026	***
EFDT	<---	EFA	.751	.267	5.479	***
IEF	<---	EFDT	.355	.065	5.044	***
SMEEP	<---	EFDT	.638	.069	6.594	***
SMEEP	<---	IEF	.208	.058	2.742	.006

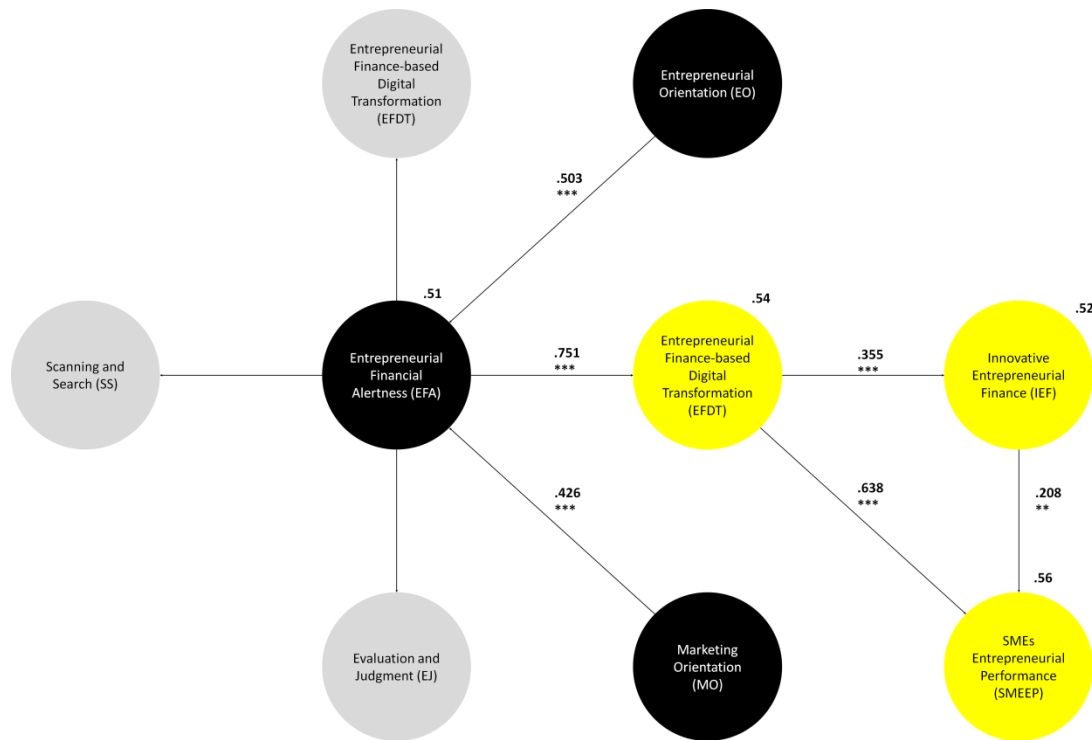


Figure 2: Model Validation

## 6. Discussion

The empirical results largely support the validity of the current study model. For instance, the current conceptual model was able to account for about 51%; 56%; 52%; and 54% of the variance in EFA; SMEEP; IEF; and EFDT, respectively. This supports our selection for the Kirzner's alertness theory [entrepreneurial alertness] (Kirzner, 1973, 1999). According to path coefficient analyses, all six proposed research hypotheses were significantly supported (see Table 8).

As a result, our findings demonstrated that entrepreneurial orientation serves as an important predicate of entrepreneurial financial alertness. These findings suggest that entrepreneurs who have a high level of conscious readiness for new chances and who adopt creativity and innovation as company philosophies will be more aware of new opportunities. To put it another way, businesses that have an entrepreneurial orientation are more likely to possess strong operational capabilities and systems that demonstrate resilience and reactivity to latent opportunities in the dynamic business environment (Sahi et al., 2019; Upadhyay et al., 2022). These findings are in line with those made public by Hughes (2017), Reijonen et al. (2015), Sahi et al. (2019), and Upadhyay et al. (2022), all of which reinforced the importance of entrepreneurial orientation.

The considerable influence of marketing orientation on entrepreneurial financial alertness was further verified by path coefficient results. Entrepreneurs who adopt a

contemporary business strategy that emphasizes the value of marketing and the necessity to satisfy customers' shifting and increasing expectations and needs consequently become vigilant and sensitive to new opportunities. To put it another way, market-oriented businesses proactively confront major market difficulties by embracing innovative and creative work that can both exceed customers' expectations and rivals' capabilities (Atuahene-Gima et al., 2005; Kohli and Jaworski, 1990; Nguyen et al., 2015).

The highest coefficient value was accounted for by the casual path between EFA and EFDT. This means that entrepreneurs, who enjoy high level of entrepreneurial alertness, are more likely to discover the latent opportunities in the digital transformation era. Accordingly, they are keen to actively adopt the smart solutions of digital transformation. In other words, a successful process of digital transformation presents a challenge that entrepreneurs would not be able to handle without fully exploring, creating, and utilizing opportunities introduced by the digital environment (Alaassar et al., 2022; Beckman et al., 2012; Troise and Tani, 2020). The significant impact of EFA and EFDT has been widely approved by different studies such as Chen et al. (2020); Neneh (2019); Sharma (2019); and Tang et al. (2012).

In line with what has been proposed in the conceptual model, both IEF and SMEEP are significantly influenced by the role of EFDT. This demonstrates that entrepreneurs and SMEs that are actively engaged in the digital transformation process, are more likely to acquire knowledge, discover new opportunities, and embrace creativity (Alaassar et al., 2022; Alalwan et al., 2022; Beliaeva et al., 2020; Upadhyay et al., 2022; Zaheer et al., 2019). In other terms, entrepreneurs, actively involved in the digital transformation process, are keen to create innovative ideas and propose smarter solutions that address environmental challenges (Alalwan et al., 2022; Lin et al., 2020).

Moreover, innovation entrepreneurial finance is significantly contributing to SMEEP. In fact, innovation is one of the crucial mechanisms that help organizations (large or SMEs) survive in a highly dynamic environment via actively seeking and proposing new ideas, methods, and entrepreneurial practices that lead to organizational sustainability and competitive advantage (Bamgbade et al., 2022; Kellermanns et al., 2012; Upadhyay et al., 2022).

The impact of EFDT on SMEEP would be attributed to the fact that the contribution captured via implementing new technologies is not restricted to facilitating the production process or enhancing customer service. Yet, it is also extended by helping entrepreneurs effectively secure financial resources for their own ventures (Mir, et al., 2022). Further, digital transformation has accelerated entrepreneurial finance activities by helping in exploring and selecting the safest and best financing options at lower costs (Abubakre et al., 2022; Upadhyay et al., 2022). This, in turn, reflects on the business and financial performance of entrepreneurial organizations.

## 6.1. Theoretical contribution

Entrepreneurial abilities to sustain in a highly competitive environment largely depends on magnitude to attract necessary financial support and take advantage of smart solutions offered by digital transformation (Kenney and Zysman, 2019). However, an important question is related to uncover keen entrepreneurial capabilities and competences that lead to fully exploit financial and digital opportunities. Therefore, a need emerged to select a solid theoretical foundation that covers influential aspects related to entrepreneurial finance success. To address such need, this study has theoretically and empirically examined the impact of entrepreneurs' capabilities (EFA) on the EFDT and SMEEP while looked at key EFA accelerators (entrepreneurial orientation and marketing orientation). The study contributed to the laying of important theoretical contributions explained hereafter.

As argued in the introduction, little is known about conducive factors for entrepreneurial success related to embedded and latent opportunities comprised in the digital transformation (Abubakre et al. 2022). Therefore, this study was added-value as it empirically examined the key antecedents and consequences of the digital transformation in SMEs context. Particularly, digital entrepreneurial finance is an emerging topic that was not been extensively investigated by prior studies. Thus, another contribution was made by proposing and examining a solid theoretical foundation covering the most important aspects pertaining particularly to entrepreneurial finance success.

There is also no clear picture of the feasibility of digital transformation for entrepreneurial organizations (Andriole, 2017; Beliaeva et al., 2020; Belyaeva et al., 2020; Davidson and Vaast, 2010; Gashenko et al., 2020; Kraus et al., 2019; Mir et al., 2022; Upadhyay et al., 2022). Accordingly, this study has also contributed to the current understanding by providing solid empirical evidence that supports the role of entrepreneurial finance-based digital transformation (EFDT) in accelerating both innovation entrepreneurial finance (IEF) and SMEs' entrepreneurial finance performance.

Most prior studies have considered entrepreneurial alertness as a key enabler of the digital transformation process, yet few attempts have been made to depict key accelerators of entrepreneurial alertness. Hence, the current study contributed to the existing literature by proposing and empirically examining entrepreneurial orientation and marketing orientation as key enablers of entrepreneurial financial alertness. It is also worth mentioning that digital entrepreneurship and entrepreneurial finance-based digital transformations (EFDT) were not well-covered in the context of Arabian countries in general and Jordan, specifically. Thus, the current study was able to expand the theoretical and empirical horizons of Kirzner's alertness theory [entrepreneurial alertness] (Kirzner, 1973) in a new context (Jordan) that relates to entrepreneurial finance-based digital transformations (EFDT).

## **6.2. Practical contribution**

The current study results provide practical and managerial guidelines related to entrepreneurial digital financial transformation. Our findings supported the role of both marketing orientation and entrepreneurial orientation. This, in turn, gives clues to entrepreneurs and SMEs to look again at the culture and philosophy adopted in conducting their business and entrepreneurial activities. In this respect, more attention should be allocated to developing countries to spread a new culture that values creativity and risk tolerance (Sahi et al., 2019).

Entrepreneurs and SMEs are recommended to proactively interact with the highly dynamic environment and markets by focusing on R&D, product development, continuous improvement, and quality assurance (Tang et al., 2012; Troise and Tani, 2020; Zhao et al., 2005). Marketing research and intelligence become an urgent necessity to discover potential customers' needs and expectations. In turn, this will contribute to the discovery and development of new business trends and dynamic consumer markets. Accordingly, entrepreneurs will become more apt to proactively and positively respond to disruptions and eventualities (Dutot and Bergeron, 2016; Fan et al., 2021; Upadhyay et al., 2022). Having adequate marketing and entrepreneurial orientation needs entrepreneurial flexibility and readiness to accept new changes and embrace innovations (Upadhyay et al., 2021).

Entrepreneurial financial alertness is a crucial driver of the entrepreneurial finance-based digital transformation (EFDT). The more entrepreneurs are able to spot new opportunities, the faster and more successful the digital transformation will be. Therefore, entrepreneurial alertness is an important capability that should be improved via developing and tailoring specialized education and training programs to search for potential opportunities, link them to market needs, and evaluate their novelty and feasibility (Upadhyay et al., 2021). In parallel, sustaining entrepreneurial alertness would also require adopting reward-based and incentive programs that encourage workers to develop and elaborate entrepreneurial skills that will foster their discoveries of new opportunities and creative solutions (Upadhyay et al., 2021).

## **7. Conclusion**

This study recognized the importance of identifying and empirically examining important entrepreneurial' capabilities that would impact the digital transformation process in the entrepreneurial finance area. According to Kirzner's alertness theory (Kirzner, 1973, 1999), entrepreneurial financial alertness was selected as key capability accelerating the EFDT. Two factors (entrepreneurial orientation and marketing orientation) were proposed to predict entrepreneurial financial alertness and EFDT. The current study model also validated the relationship between EFDT and both innovation entrepreneurial finance (IEF) and SMEs' entrepreneurial finance performance. Data was collected using online questionnaire distributed to a purposive sample size of 214 entrepreneurs in Jordan. We conducted SEM analyses, and the

empirical results largely supported the predictive validity of the conceptual model, with  $R^2$  values ranging from 51% (EFA); 54% (SMEEP); and 56% (EFDT). According to the structural model analyses, the six proposed research hypotheses were significant. In details, both MO and EO significantly and positively predicted EFA. The most significant and strongest hypothesized path was depicted between EFA and EFDT. Finally, we found that EFDT has significantly influenced IEF and SMEEP.

### **7.1. Limitations and Future Research Directions**

Though the present study expanded the knowledge of the critical and antecedent factors of the digital entrepreneurial transformation, we faced some limitations. For instance, this study only adopted entrepreneurial financial alertness as a key capability that predicts EFDT. However, other capabilities (human capital; social capital; financial condition; information capital) might exist and can be assessed in future studies (Chen et al., 2020; Trainor, 2012). In this respect, resource-based view theory and dynamic capabilities theory are helpful to figure out the most important capabilities that can impact the success of entrepreneurial digital transformation (Barney, 2001; Grant, 1991; Mikalef et al., 2017; Mikalef and Gupta, 2021; Teece et al., 1997). Marketing orientation and entrepreneurial orientation were proposed in the current study as key antecedents of entrepreneurial financial alertness. Therefore, future studies can introduce other drivers such as organizational agility; organizational culture; and leaning style and skills (Brandt et al., 2019; Linzalone et al., 2020; Wamba, 2022). Furthermore, the marketing orientation and entrepreneurial orientation were proposed to have an indirect impact on EFDT via entrepreneurial alertness. We recommend testing the direct relationship between these factors and EFDT. Finally, this study was conducted in Jordan, which in turn would reflect on the results' generalizability. Thus, future studies can consider different countries and address related geographical and cultural issues related to entrepreneurial finance-based digital transformation .

### **References**

- Abubakre, M., Zhou, Y., & Zhou, Z. (2022). The impact of information technology culture and personal innovativeness in information technology on digital entrepreneurship success. *Information Technology & People*, 35(1), 204-231.
- Ahadi, S., & Kasraie, S. (2020). Contextual factors of entrepreneurship intention in manufacturing SMEs: the case study of Iran. *Journal of Small Business and Enterprise Development*, 27(4), 633-657.
- Ahmed, H., & Aassouli, D. (2022). Entrepreneurial finance, agency problems and Islamic ethics: complementarities and constraints. *Venture Capital*, 24(1), 25-46.
- Alaassar, A., Mention, A.L. and Aas, T.H. (2022). Facilitating innovation in FinTech: a review and research agenda. *Review of Managerial Science*, pp. 1-34. DOI: <https://doi.org/10.1007/s11846-022-00531-x>.
- Aladwani, A. M., & Dwivedi, Y. K. (2018). Towards a theory of SocioCitizenry: Quality anticipation, trust configuration, and approved adaptation of governmental social media. *International Journal of Information Management*, 43, 261-272.



- Alalwan, A. A., Baabdullah, A. M., Mahfod, J. O., Jones, P., Sharma, A., & Dwivedi, Y. K. (2022). Entrepreneurial e-equity crowdfunding platforms: antecedents of knowledge acquisition and innovation performance. *European Journal of Innovation Management*, (ahead-of-print). DOI: <https://doi.org/10.1108/EJIM-03-2022-0167>.
- Amoako, G., Omari, P., Kumi, D. K., Agbemabiase, G. C., & Asamoah, G. (2021). Conceptual framework—artificial intelligence and better entrepreneurial decision-making: the influence of customer preference, industry benchmark, and employee involvement in an emerging market. *Journal of Risk and Financial Management*, *14*(12), 604.
- Anderson, J. C. and Gerbing, D. W. (1988). Structural equation modelling in practice: A review and recommended two-step approach. *Psychological Bulletin*, *103*(3), 411-423.
- Andriole, S.J. (2017). Five myths about digital transformation. *MIT Sloan Management Review*, *58*(3), 1-5.
- Atuahene-Gima, K., Slater, S. F., & Olson, E. M. (2005). The contingent value of responsive and proactive market orientations for new product program performance. *Journal of Product Innovation Management*, *22*(6), 464-482.
- Avlonitis, G. J., & Salavou, H. E. (2007). Entrepreneurial orientation of SMEs, product innovativeness, and performance. *Journal of Business Research*, *60*(5), 566-575.
- Baabdullah, A. M., Alalwan, A. A., Rana, N. P., Patil, P., & Dwivedi, Y. K. (2019). An integrated model for m-banking adoption in Saudi Arabia. *The International Journal of Bank Marketing*, *37*(2), 452-478.
- Baker, W. E., & Sinkula, J. M. (2005). Market orientation and the new product paradox. *Journal of Product Innovation Management*, *22*(6), 483-502.
- Baker, W. E., & Sinkula, J. M. (2009). The complementary effects of market orientation and entrepreneurial orientation on profitability in small businesses. *Journal of Small Business Management*, *47*(4), 443-464.
- Bamgbade, J. A., Nawi, M. N. M., Kamaruddeen, A. M., Adeleke, A. Q., & Salimon, M. G. (2022). Building sustainability in the construction industry through firm capabilities, technology and business innovativeness: empirical evidence from Malaysia. *International Journal of Construction Management*, *22*(3), 473-488.
- Beckman, C. M., Eisenhardt, K., Kotha, S., Meyer, A., & Rajagopalan, N. (2012). The Role of the Entrepreneur in Technology Entrepreneurship. *Strategic Entrepreneurship Journal*, *6*, 203-206.
- Beliaeva, T., Ferasso, M., Kraus, S., & Damke, E. J. (2020). Dynamics of digital entrepreneurship and the innovation ecosystem: A multilevel perspective. *International Journal of Entrepreneurial Behavior & Research*, *26*(2), 266-284.
- Belyaeva, Z., Shams, S. R., Santoro, G., & Grandhi, B. (2020). Unpacking stakeholder relationship management in the public and private sectors: the comparative insights. *EuroMed Journal of Business*, *15*(3), 269-281.
- Bernardes, E. S., & Hanna, M. D. (2009). A theoretical review of flexibility, agility and responsiveness in the operations management literature: Toward a conceptual definition of customer responsiveness. *International Journal of Operations & Production Management*, *29*(1), 30-53.
- Berre, M., & Le Pendeven, B. (2022). What do we know about startup-valuation drivers? A systematic literature review. *Venture Capital*, 1-45.
- Bhattacharjee, A. (2012). *Social science research: Principles, methods, and practices*. (2<sup>nd</sup> Ed.). Florida, USA: AnolBhattacharjee.
- Boso, N., Story, V. M., & Cadogan, J. W. (2013). Entrepreneurial orientation, market orientation, network ties, and performance: Study of entrepreneurial firms in a developing economy. *Journal of Business Venturing*, *28*(6), 708-727.
- Brislin, R. (1976). Comparative research methodology: Cross-cultural studies. *International Journal of Psychology*, *11*(3), 215-229.

- Byrne, B. (2010). *Structural equation modeling with AMOS: Basic concepts, applications and programming*. (6<sup>th</sup> Ed.). New York, USA: Taylor & Francis Group.
- Camisón, C., & Villar-López, A. (2011). Non-technical innovation: Organizational memory and learning capabilities as antecedent factors with effects on sustained competitive advantage. *Industrial Marketing Management*, 40(8), 1294-1304.
- Cano, C. R., Carrillat, F. A., & Jaramillo, F. (2004). A meta-analysis of the relationship between market orientation and business performance: evidence from five continents. *International Journal of Research in Marketing*, 21(2), 179-200.
- Chakraborty, U., & Biswal, S. K. (2023). Impact of social media participation on female entrepreneurs towards their digital entrepreneurship intention and psychological empowerment. *Journal of Research in Marketing and Entrepreneurship*, (ahead-of-print).
- Chatterjee, S., Chaudhuri, R., Vrontis, D., & Basile, G. (2021). Digital transformation and entrepreneurship process in SMEs of India: a moderating role of adoption of AI-CRM capability and strategic planning. *Journal of Strategy and Management*, 15(3), 416-433.
- Chatterjee, S., Nguyen, B., Ghosh, S. K., Bhattacharjee, K. K., & Chaudhuri, S. (2020a). Adoption of artificial intelligence integrated CRM system: an empirical study of Indian organizations. *The Bottom Line*, 33(4), 359-375.
- Chavez, R., Yu, W., Jacobs, M. A., & Feng, M. (2017). Manufacturing capability and organizational performance: The role of entrepreneurial orientation. *International Journal of Production Economics*, 184, 33-46.
- Chen, P. C., Chan, W. C., Hung, S. W., & Lin, D. Z. (2020). How entrepreneurs recognise entrepreneurial opportunity and its gaps: a cognitive theory perspective. *Technology Analysis & Strategic Management*, 32(2), 223-238.
- Chen, Y. C., Li, P. C., & Evans, K. R. (2012). Effects of interaction and entrepreneurial orientation on organizational performance: Insights into market driven and market driving. *Industrial Marketing Management*, 41(6), 1019-1034.
- Cooper, A. C., & Artz, K. W. (1995). Determinants of satisfaction for entrepreneurs. *Journal of Business Venturing*, 10(6), 439-457.
- Cooper, C. A., and K. W. Artz. (1995). Determinants of Satisfaction for Entrepreneurs. *Journal of Business Venturing*, 10(6), 439-457.
- Cuntz, A., & Peuckert, J. (2023). From hackers to start-ups: Innovation commons and local entrepreneurial activity. *Research Policy*, 52(2), 104675.
- Davidson, E. and Vaast, E. (2010). Digital entrepreneurship and its sociomaterial enactment. *Proceedings of the 43rd Hawaii International Conference on System Sciences*, pp. 1-10.
- Davison, R. M., Wong, L. H., & Peng, J. (2023). The art of digital transformation as crafted by a chief digital officer. *International Journal of Information Management*, 69, 102617.
- Dias, C., & Rocha, R. G. (2023). Big Data and Digital Expertise: Analytics Puzzles for Food Industry Entrepreneurs. In *Bleeding-Edge Entrepreneurship: Digitalization, Blockchains, Space, the Ocean, and Artificial Intelligence* (Vol. 16, pp. 19-30). Emerald Publishing Limited.
- Dubey, R., Gunasekaran, A., Childe, S. J., Bryde, D. J., Giannakis, M., Foropon, C., ... & Hazen, B. T. (2020). Big data analytics and artificial intelligence pathway to operational performance under the effects of entrepreneurial orientation and environmental dynamism: A study of manufacturing organisations. *International Journal of Production Economics*, 226, 107599.
- Dutot, V., & Bergeron, F. (2016). From strategic orientation to social media orientation: Improving SMEs' performance on social media. *Journal of Small Business and Enterprise Development*, 23(4), 1165-1190.
- El Sawy, O. A., Kræmmergaard, P., Amsinck, H., & Vinther, A. L. (2020). How LEGO built the foundations and enterprise capabilities for digital leadership. In *Strategic Information Management* (pp. 174-201). Routledge.

- Elnadi, M., & Gheith, M. H. (2023). The role of individual characteristics in shaping digital entrepreneurial intention among university students: Evidence from Saudi Arabia. *Thinking Skills and Creativity*, 101236.
- Fan, M., Qalati, S. A., Khan, M. A. S., Shah, S. M. M., Ramzan, M., & Khan, R. S. (2021). Effects of entrepreneurial orientation on social media adoption and SME performance: The moderating role of innovation capabilities. *PloS one*, 16(4), e0247320.
- Farrelly, F., & Quester, P. (2003). The effects of market orientation on trust and commitment: The case of the sponsorship business-to-business relationship. *European Journal of Marketing*, 37(3/4), 530-553.
- Gashenko, I. V., Khakhonova, N. N., Orobinskaya, I. V., & Zima, Y. S. (2020). Competition between human and artificial intellectual capital in production and distribution in Industry 4.0. *Journal of Intellectual Capital*, 21(4), 531-547.
- Gaweł, A., & Mińska-Struzik, E. (2023). The digitalisation as gender equaliser? The import and export of digitally delivered services in shaping female entrepreneurship in European countries. *International Journal of Gender and Entrepreneurship*, (ahead-of-print).
- George, B. A., & Marino, L. (2011). The epistemology of entrepreneurial orientation: Conceptual formation, modeling, and operationalization. *Entrepreneurship Theory and Practice*, 35(5), 989-1024.
- Giunipero, L. C., Denslow, D., & Eltantawy, R. (2005). Purchasing/supply chain management flexibility: Moving to an entrepreneurial skill set. *Industrial Marketing Management*, 34(6), 602-613.
- Global Entrepreneurship Monitor. (2020). *Entrepreneurial Behaviour and Attitudes*. Available at: <https://www.gemconsortium.org/economy-profiles/jordan>. Accessed on 28/9/2022.
- Gomes, S., & Lopes, J. M. (2023). The transformational impact of digital venture ecosystems on entrepreneurship in Europe. In *Bleeding-Edge Entrepreneurship: Digitalization, Blockchains, Space, the Ocean, and Artificial Intelligence* (16, pp. 91-116). Emerald Publishing Limited.
- Habibi, F., Hamilton, C. A., Valos, M. J., & Callaghan, M. (2015). E-marketing orientation and social media implementation in B2B marketing. *European Business Review*, 27(6), 638-655.
- Hair Jr, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). *Multivariate data analysis: A global perspective*. (7<sup>th</sup> Ed.). Pearson Education International.
- Hansen, B. (2019). The digital revolution—digital entrepreneurship and transformation in Beijing. *Small Enterprise Research*, 26(1), 36-54.
- Holzmann, P., & Gregori, P. (2023). The promise of digital technologies for sustainable entrepreneurship: A systematic literature review and research agenda. *International Journal of Information Management*, 68, 102593.
- Holzmann, P., & Gregori, P. (2023). The promise of digital technologies for sustainable entrepreneurship: A systematic literature review and research agenda. *International Journal of Information Management*, 68, 102593.
- Hughes, D. L., Dwivedi, Y. K., Rana, N. P., & Simintiras, A. C. (2016). Information systems project failure—analysis of causal links using interpretive structural modelling. *Production Planning & Control*, 27(16), 1313-1333.
- Hughes, P., Hodgkinson, I. R., Hughes, M., & Arshad, D. (2018). Explaining the entrepreneurial orientation—performance relationship in emerging economies: The intermediate roles of absorptive capacity and improvisation. *Asia Pacific Journal of Management*, 35(4), 1025-1053.
- Imran, F., Shahzad, K., Butt, A., & Kantola, J. (2020, July). Leadership competencies for digital transformation: evidence from multiple cases. In *International Conference on Applied Human Factors and Ergonomics* (pp. 81-87). Springer, Cham.

- Jain, R., Ali, S. W., & Kamble, S. (2015). Entrepreneurial and intrapreneurial attitudes: Conceptualization, measure development, measure test and model fit. *Management and Labour Studies*, 40(1-2), 1-21.
- Kellermanns, F. W., Eddleston, K. A., Sarathy, R., & Murphy, F. (2012). Innovativeness in family firms: A family influence perspective. *Small Business Economics*, 38(1), 85-101.
- Kenney, M., & Zysman, J. (2019). Unicorns, Cheshire cats, and the new dilemmas of entrepreneurial finance. *Venture Capital*, 21(1), 35-50.
- Kickul, J. R., Griffiths, M. D., Jayaram, J., & Wagner, S. M. (2011). Operations management, entrepreneurship, and value creation: Emerging opportunities in a cross-disciplinary context. *Journal of Operations Management*, 29(1-2), 78-85.
- Kirzner, I. M. (1999). Creativity and/or alertness: A reconsideration of the Schumpeterian entrepreneur. *The review of Austrian economics*, 11(1), 5-17.
- Kirzner, I.M. (1973). *Competition and Entrepreneurship*, University of Chicago Press, Chicago.
- Kline, R. B. (2005). *Principles and practice of structural equation modelling*. New York: The Guilford Press.
- Kohli, A. K., & Jaworski, B. J. (1990). Market orientation: The construct, research propositions, and managerial implications. *The Journal of Marketing*, 54(2), 1-18.
- Koomson, I., Martey, E., & Etwire, P. M. (2022). Mobile money and entrepreneurship in East Africa: the mediating roles of digital savings and access to digital credit. *Information Technology & People*, (ahead-of-print). DOI: <https://doi.org/10.1108/ITP-11-2021-0906>.
- Kraus, S., Palmer, C., Kailer, N., Kallinger, F. L., & Spitzer, J. (2019). Digital entrepreneurship: A research agenda on new business models for the twenty-first century. *International Journal of Entrepreneurial Behavior & Research*, 25(2), 353-375.
- Kundu, S. C., Mor, A., Kumar, S., & Bansal, J. (2019). Diversity within management levels and organizational performance: employees' perspective. *Journal of Advances in Management Research*, 17(1), 110-130.
- Li, Y., Liu, Y., & Zhao, Y. (2006). The role of market and entrepreneurship orientation and internal control in the new product development activities of Chinese firms. *Industrial Marketing Management*, 35(3), 336-347.
- Lin, W. S., Chen, H. R., & Yang, M. L. (2020). How do we learn to get success together through crowdfunding platform? From the perspectives of system learning and multi-motivations. *Telematics and Informatics*, 52, 101428.
- Lumpkin, G. T., & Dess, G. G. (1996). Clarifying the entrepreneurial orientation construct and linking it to performance. *Academy of management Review*, 21(1), 135-172.
- Luo, Y., Peng, Y., & Zeng, L. (2021). Digital financial capability and entrepreneurial performance. *International Review of Economics & Finance*, 76, 55-74.
- Matarazzo, M., Penco, L., Profumo, G., & Quaglia, R. (2021). Digital transformation and customer value creation in Made in Italy SMEs: A dynamic capabilities perspective. *Journal of Business Research*, 123, 642-656.
- Mazzarol, T. (2015). SMEs engagement with e-commerce, e-business and e-marketing. *Small Enterprise Research*, 22(1), 79-90.
- Merrilees, B., Rundle-Thiele, S., & Lye, A. (2011). Marketing capabilities: Antecedents and implications for B2B SME performance. *Industrial Marketing Management*, 40(3), 368-375.
- Miller, D. (1983). The correlates of entrepreneurship in three types of firms. *Management Science*, 29(7), 770-791.
- Mir, A. A., Hassan, S., & Khan, S. J. (2022). Understanding digital entrepreneurial intentions: A capital theory perspective. *International Journal of Emerging Markets*, (ahead-of-print). DOI: <https://doi.org/10.1108/IJOEM-05-2021-0687>.

- Morse, E. A., Fowler, S. W., & Lawrence, T. B. (2007). The impact of virtual embeddedness on new venture survival: Overcoming the liabilities of newness. *Entrepreneurship Theory and Practice*, 31(2), 139-159.
- Müller, H., & Wöhler, J. (2023). Married at first sight: the process of trust formation throughout the venture capital process during the time of the COVID-19 crisis. *Venture Capital*, 25(1), 1-29.
- Mutlu, H. M., & Sürer, A. (2015). Effects of market, e-marketing, and technology orientations on innovativeness and performance in Turkish health organizations. *Health Marketing Quarterly*, 32(4), 313-329.
- Narver, J. C., Slater, S. F., & MacLachlan, D. L. (2004). Responsive and proactive market orientation and new-product success. *Journal of Product Innovation Management*, 21(5), 334-347.
- Neneh, B. N. (2019). From entrepreneurial alertness to entrepreneurial behavior: The role of trait competitiveness and proactive personality. *Personality and Individual Differences*, 138, 273-279.
- Ngoasong, M. Z. (2017). Digital entrepreneurship in a resource-scarce context: A focus on entrepreneurial digital competencies. *Journal of Small Business and Enterprise Development*, 25(3), 483-500.
- Nunnally, J. C. (1978). *Psychometric theory*. New York, NY: McGraw-Hill.
- Örnek, A. Ş., & Ayas, S. (2015). The relationship between intellectual capital, innovative work behavior and business performance reflection. *Procedia-Social and Behavioral Sciences*, 195, 1387-1395.
- Papadas, K. K., Avlonitis, G. J., & Carrigan, M. (2017). Green marketing orientation: Conceptualization, scale development and validation. *Journal of Business Research*, 80, 236-246.
- Paul, J., Alhassan, I., Binsaif, N., & Singh, P. (2023). Digital entrepreneurship research: A systematic review. *Journal of Business Research*, 156, 113507.
- Preda, G. (2013). The influence of entrepreneurial orientation and market-based organizational learning on the firm's strategic innovation capability. *Management & Marketing*, 8(4), 607.
- Rauch, A., Wiklund, J., Lumpkin, G. T., & Frese, M. (2009). Entrepreneurial orientation and business performance: An assessment of past research and suggestions for the future. *Entrepreneurship Theory and Practice*, 33(3), 761-787.
- Reijonen, H., Hirvonen, S., Nagy, G., Laukkanen, T., & Gabrielsson, M. (2015). The impact of entrepreneurial orientation on B2B branding and business growth in emerging markets. *Industrial Marketing Management*, 51, 35-46.
- Rothberg, H. N., & Erickson, G. S. (2017). Big data systems: Knowledge transfer or intelligence insights? *Journal of Knowledge Management*, 21(1), 92-112.
- Sahi, G. K., Gupta, M. C., Cheng, T. C. E., & Lonial, S. C. (2019). Relating entrepreneurial orientation with operational responsiveness: Roles of competitive intensity and technological turbulence. *International Journal of Operations & Production Management*, 39(5), 739-766.
- Saunders, M., Lewis, P., and Thornhill, A. (2003). *Research methods for business students*. (3<sup>rd</sup> Ed.). Harlow: Prentice Hall.
- Schiama, G., Schettini, E., Santarsiero, F., & Carlucci, D. (2022). The transformative leadership compass: six competencies for digital transformation entrepreneurship. *International Journal of Entrepreneurial Behavior & Research*, 28(5), 1273-1291.
- Schulz, S. A., Martin, T., & Meyer, H. M. (2017). Factors influencing organization commitment: Internal marketing orientation, external marketing orientation, and subjective well-being. *Journal of management development*, 36(10), 1294-1303.
- Sekaran, U. (2003). *Research methods for business: A skill-building approach*. 4<sup>th</sup> Ed.). John Wiley & Sons.
- Senyo, P. K., & Osabutey, E. L. (2020). Unearthing antecedents to financial inclusion through FinTech innovations. *Technovation*, 98, 102155.

- Senyo, P. K., Osabutey, E. L., & Kan, K. A. S. (2020). Pathways to improving financial inclusion through mobile money: a fuzzy set qualitative comparative analysis. *Information Technology & People*, 37(7), 1997-2017.
- Serwaah, P., & Shneor, R. (2021). Women and entrepreneurial finance: a systematic review. *Venture Capital*, 23(4), 291-319.
- Seyfang, G., & Smith, A. (2007). Grassroots innovations for sustainable development: Towards a new research and policy agenda. *Environmental Politics*, 16(4), 584-603.
- Shaltoni, A. M., & West, D. C. (2010). The measurement of e-marketing orientation (EMO) in business-to-business markets. *Industrial Marketing Management*, 39(7), 1097-1102.
- Sharma, L. (2019). A systematic review of the concept of entrepreneurial alertness. *Journal of Entrepreneurship in Emerging Economies*, 11(2), 217-233.
- Shukla, A., Kushwah, P., Jain, E., & Sharma, S. K. (2021). Role of ICT in emancipation of digital entrepreneurship among new generation women. *Journal of Enterprising Communities: People and Places in the Global Economy*, 15(1), 137-154.
- Sigfusson, T., & Chetty, S. (2013). Building international entrepreneurial virtual networks in cyberspace. *Journal of World Business*, 48(2), 260-270.
- Smart, D. T., & Conant, J. S. (1994). Entrepreneurial orientation, distinctive marketing competencies and organizational performance. *Journal of Applied Business Research (JABR)*, 10(3), 28-38.
- Soluk, J., Kammerlander, N., & Darwin, S. (2021). Digital entrepreneurship in developing countries: The role of institutional voids. *Technological Forecasting and Social Change*, 170, 120876.
- Sriboonlue, P. (2019). Strategic entrepreneurial awareness and business performance: Empirical evidence from small and medium-sized enterprises in Thailand. *Procedia Computer Science*, 158, 653-661.
- Srinivasan, R., Lilien, G., & Rangaswamy, A. (2002). Technological opportunism and radical technology adoption: An application to e-business. *Journal of Marketing*, 66(3), 47-60.
- Tajeddini, K. (2010). Effect of customer orientation and entrepreneurial orientation on innovativeness: Evidence from the hotel industry in Switzerland. *Tourism Management*, 31(2), 221-231.
- Tang, J., Kacmar, K. M. M., & Busenitz, L. (2012). Entrepreneurial alertness in the pursuit of new opportunities. *Journal of Business Venturing*, 27(1), 77-94.
- Trainor, K. J. (2012). Relating social media technologies to performance: A capabilities-based perspective. *Journal of Personal Selling & Sales Management*, 32(3), 317-331.
- Troise, C., & Tani, M. (2020). Exploring entrepreneurial characteristics, motivations and behaviours in equity crowdfunding: some evidence from Italy. *Management Decision*, 59(5), 995-1024.
- Upadhyay, N., Upadhyay, S., & Dwivedi, Y. K. (2022). Theorizing artificial intelligence acceptance and digital entrepreneurship model. *International Journal of Entrepreneurial Behavior & Research*, 28(5), 1138-1166.
- Upadhyay, N., Upadhyay, S., Al-Debei, M. M., Baabdullah, A. M., & Dwivedi, Y. K. (2022). The influence of digital entrepreneurship and entrepreneurial orientation on intention of family businesses to adopt artificial intelligence: examining the mediating role of business innovativeness. *International Journal of Entrepreneurial Behavior & Research*, (ahead-of-print). DOI: <https://doi.org/10.1108/IJEER-02-2022-0154>.
- Valliere, D. (2013). Towards a schematic theory of entrepreneurial alertness. *Journal of Business Venturing*, 28(3), 430-442.
- Veronica, S., Alexeis, G. P., Valentina, C., & Elisa, G. (2020). Do stakeholder capabilities promote sustainable business innovation in small and medium-sized enterprises? Evidence from Italy. *Journal of Business Research*, 119, 131-141.
- Wang, C., Teo, T. S., & Janssen, M. (2021). Public and private value creation using artificial intelligence: An empirical study of AI voice robot users in Chinese public sector. *International Journal of Information Management*, 61, 102401.

- Xu, Y., Li, X., bin Mustakim, F., Alotaibi, F. M., & Abdullah, N. N. (2022). Investigating the business intelligence capabilities' and network learning effect on the data mining for start-up's function. *Information Processing & Management*, 59(5), 103055.
- Yadav, H., Kar, A. K., & Kashiramka, S. (2021). How does entrepreneurial orientation and SDG orientation of CEOs evolve before and during a pandemic. *Journal of Enterprise Information Management*, 35(1), 160-178.
- Yadav, M. S., & Pavlou, P. A. (2014). Marketing in computer-mediated environments: Research synthesis and new directions. *Journal of Marketing*, 78(1), 20-40.
- Yang, Z., Chang, J., Huang, L., & Mardani, A. (2021). Digital transformation solutions of entrepreneurial SMEs based on an information error-driven T-spherical fuzzy cloud algorithm. *International Journal of Information Management*, 102384.
- Yao, M., & Li, J. (2023). The causal exploration of digital entrepreneurial psychological capital configurations based on fsQCA. *Journal of Innovation & Knowledge*, 8(1), 100291.
- Yıldız, S., Baştürk, F., & Boz, İ. T. (2014). The effect of leadership and innovativeness on business performance. *Procedia-Social and Behavioral Sciences*, 150, 785-793.
- Yousaf, Z., Sahar, N., Majid, A., & Rafiq, A. (2018). The effects of e-marketing orientation on strategic business performance: Mediating role of e-trust. *World Journal of Entrepreneurship, Management and Sustainable Development*, 14(3), 309-320.
- Zaheer, H., Breyer, Y., & Dumay, J. (2019). Digital entrepreneurship: An interdisciplinary structured literature review and research agenda. *Technological Forecasting and Social Change*, 148, 119735.
- Zahra, S. A., Liu, W., & Si, S. (2023). How digital technology promotes entrepreneurship in ecosystems. *Technovation*, 119, 102457.
- Zenebe, A., Alsaaty, F. M., & Anyiwo, D. (2018). Relationship between individual's entrepreneurship intention, and adoption and knowledge of information technology and its applications: an empirical study. *Journal of Small Business & Entrepreneurship*, 30(3), 215-232.
- Zhai, Y., Yang, K., Chen, L., Lin, H., Yu, M., & Jin, R. (2022). Digital entrepreneurship: global maps and trends of research. *Journal of Business & Industrial Marketing*, (ahead-of-print). DOI: <https://doi.org/10.1108/JBIM-05-2021-0244>.
- Zhao, H., Hills, G.E. & Seibert, S.E. (2005). The mediating role of self-efficacy in the development of entrepreneurial intentions. *Journal of Applied Psychology*, 90(6), 1265-1272.

